

Tensile properties, swelling, and water absorption behavior of rice-husk-powder-filled polypropylene/ (recycled acrylonitrile-butadiene rubber) composites

Abstract

The effect of rice husk powder (RHP) on the tensile properties, swelling, water absorption, and morphology of polypropylene (PP)/[recycled acrylonitrile-butadiene rubber (NBRr)]/RHP composites was studied. Composites containing 0 to 30 parts of RHP per hundred parts of resin were prepared by using a Haake Rheomix Polydrive R 600/610 mixer at 180°C with a rotor speed of 50 rpm. Results indicated that the tensile strength and elongation at break decreased but that the tensile modulus increased with increasing amounts of RHP. Swelling of the PP/NBRr/RHP composites in oil and toluene increased with increasing RHP contents, and the composites exhibited a non-Fickian diffusion with a two stage absorption mechanism. Micrographs acquired by SEM revealed an increasing number of voids and micro-holes on the tensile-fractured surfaces of the composites with increasing amounts of RHP.